

DIRECTORATE OF GOVERNMENT EXAMINATION, CHENNAI-6
CHENGALPATTU DISTRICT

HALFYEARLY EXAMINATION. DEC-2024

XI. BIOLOGY

I. BIO- BOTANY – KEY ANSWER

Max. Marks: 35

SECTION - 1			
Note: - (i). Answer all the questions.			8 X 1 = 8
Q. No	Options	Answer	
1.BB	B	Before fertilization	
2. B.IN	A	IAA	
3. B.IN	D	Phellem, phellogen and phelloderm	
4. BB	C	Syncarpous	
5. B.IN	B	1-(iii), 2-(v), 3-(iv), 4-(i)	
6. BB	C	Serotaxonomy	
7. B.IN	D	Statement I is incorrect but statement II is correct	
8.BB	D	B	
SECTION – 2			
Answer any 4 questions:			4 X 2 = 8
Q. No	Answer		Marks
9. BB	Nucleoside and Nucleotide:		1 2 1
	Nucleoside	Nucleotide	
	It is a combination of base and sugar A nitrogenous base is linked to pentose sugar through n-glycosidic linkage and forms a nucleoside Adenosine, Guanosine, Cytidine and Deoxythymidine	It is a combination of nucleoside and phosphoric acid. When a phosphate group is attached to a nucleoside it is called a nucleotide Adenylic acid, Guanylic acid, Cytidylic acid and Uridylic acid	
10. B.IN	Importance of Studying Growth Rings: (any two)		2 X 1 2
<ul style="list-style-type: none"> ➤ Age of wood can be calculated. ➤ The quality of timber can be ascertained. ➤ Radio-Carbon dating can be verified. ➤ Past climate and archaeological dating can be made. ➤ Provides evidence in forensic investigation. 			
11. B.IN	Krebs cycle - Amphibolic pathway:		2 X 1 2
<ul style="list-style-type: none"> ➤ It is primarily a catabolic pathway. ➤ But it provides precursors for various biosynthetic pathways there by an anabolic pathway too. 			
12. BB	Mineral deficiency of Plant A and B:		1 1 2
<ul style="list-style-type: none"> ➤ i). Deficiency of Plant A -- Molybdenum ➤ ii). Deficiency of Plant B -- Zinc 			

13. B.IN	Cyathium inflorescence: - <ul style="list-style-type: none"> ➤ It consists of small unisexual flowers enclosed by a common involucre which mimics a single flower. ➤ Male flowers are organised in a scorpioid manner. ➤ Female flower is solitary and centrally located on a long pedicel. ➤ Male flower is represented only by stamens ➤ Female flower is represented only by a pistil. ➤ Cyathium may be actinomorphic or zygomorphic ➤ Nectar is present in involucre. <p style="text-align: center;">(or)</p> <ul style="list-style-type: none"> ➤ Special type of inflorescence consists of small unisexual flowers. ➤ Centrally located single female flower surrounded by male flowers. ➤ Male flower represented by only stamen ➤ Female flower represented only by pistil. ➤ Involucre protect flowers and consist of nectar (practical portion) 	4 X ½	2				
14. BB	Non-photosynthetic parts of a plant that need a supply of sucrose: <ul style="list-style-type: none"> ➤ Roots ➤ Tubers ➤ Stems of older plants, flowers and fruits. 	½ ½ 1	2				
SECTION - 3							
Answer any three of the following including Q.No.19 which is compulsory			3 X 3 = 9				
15. B.IN	Physiological effects of Auxin: (any three) <ul style="list-style-type: none"> ➤ Promote cell elongation in stem and coleoptile. ➤ At higher concentrations auxins inhibit the elongation of roots but extremely lower concentrations promote growth of root. ➤ Suppression of growth in lateral bud by apical bud due to auxin produced by apical bud is termed as apical dominance. ➤ Prevents abscission. ➤ Used to eradicate weeds. Example: 2,4-D and 2,4,5-T. ➤ Synthetic auxins are used in the formation of seedless fruits (Parthenocarpic fruit). ➤ Used to break the dormancy in seeds. 	3 X 1	3				
16. BB	Go phase: <ul style="list-style-type: none"> ➤ A quiescent stage called Go, where the cell remains metabolically active without proliferation. ➤ Cells can exist for long periods in Go phase. ➤ In Go, cells cease growth with reduced rate of RNA and protein synthesis. ➤ The Go phase is not permanent. Mature neuron and skeletal muscle cell remain permanently in Go. ➤ Many cells in animals remains in Go unless called on to proliferate by appropriate growth factors or other extracellular signals. ➤ Go cells are not dormant. 	6 X ½	3				
17. BB	Root climbers differ from Stem climbers:		2 1 3				
	1	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Root climbers</th> <th style="width: 50%; text-align: center;">Stem climbers</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Plants climbing with the help of adventitious roots.</td> <td style="padding: 5px;">Climbers lack specialised structure for climbing and the stem itself coils around the support.</td> </tr> </tbody> </table>		Root climbers	Stem climbers	Plants climbing with the help of adventitious roots.	Climbers lack specialised structure for climbing and the stem itself coils around the support.
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2	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 50%; padding: 5px;"><i>Piper betel, Piper nigrum, Pothos.</i> (any one e.g)</td> <td style="width: 50%; padding: 5px;"><i>Ipomoea, Clitoral, Quisqualis</i> (any one e.g)</td> </tr> </tbody> </table>	<i>Piper betel, Piper nigrum, Pothos.</i> (any one e.g)	<i>Ipomoea, Clitoral, Quisqualis</i> (any one e.g)				
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18. BB	Haplontic and Diplontic life cycle: (any three)		3 X 1	3	
		Haplontic life cycle			Diplontic life cycle
	1	Gametophytic phase is dominant, photosynthetic and independent.			Sporophytic phase (2n) is dominant, photosynthetic and independent.
	2	Sporophytic phase is represented by the zygote.			The gametophytic phase is represented by the single to few celled gametophytes.
	3	Zygote undergoes meiosis to restore haploid condition			The gametes fuse to form zygote which develops into sporophyte.
4	(E.g). <i>Volvox, Spirogyra.</i> (any one)	(E.g) <i>Fucus</i> , gymnosperms and angiosperms. (any one)			

19. B.IN	T.S of Monocot leaf: (Draw & label)	2 + 1	3

SECTION - 4

Answer the following

2 X 5 = 10

21. (a) B.IN	Photorespiration: (flow chart or explanation)	5	5
(or)			

	<ul style="list-style-type: none"> ➤ C2 Cycle takes place in chloroplast, peroxisome and mitochondria. ➤ RUBP is converted into PGA and a 2C-compound phosphoglycolate by Rubisco enzyme in chloroplast. ➤ Since the first product is a 2C-compound, this cycle is known as C2 Cycle. ➤ Phosphoglycolate by loss of phosphate becomes glycolate. ➤ Glycolate formed in chloroplast enters into peroxisome to form glyoxylate and hydrogen peroxide. ➤ Glyoxylate is converted into glycine and transferred into mitochondria. ➤ In mitochondria, two molecules of glycine combine to form serine. ➤ Serine enters into peroxisome to form hydroxy pyruvate. ➤ Hydroxy pyruvate with help of NADH+ H+ becomes glyceric acid. ➤ Glyceric acid is cycled back to chloroplast utilising ATP and becomes Phosphoglyceric acid (PGA) and enters into the Calvin cycle (PCR cycle). <p style="text-align: center;">(Or)</p>	10 X ½	5
(b). B.IN	<p>Economic importance of fungi:</p> <ul style="list-style-type: none"> ➤ Provide delicious and nutritious food called mushrooms. ➤ Recycle the minerals by decomposing the litter thus adding fertility to the soil. ➤ Dairy industry is based on a single celled fungus called yeast. ➤ They deteriorate the timber. ➤ Cause food poisoning due the production of toxins. <p style="text-align: right;">(or)</p>	5 X 1	5
	<p>1. Beneficial activities: (any five with one example in each)</p> <p>1). Food</p> <ul style="list-style-type: none"> ➤ Mushrooms like <i>Lentinus edodes</i>, <i>Agaricus bisporus</i>, <i>Volvariella volvaceae</i> are consumed for their high nutritive value ➤ Yeasts provide vitamin B and <i>Eremothecium ashbyii</i> is a rich source of Vitamin B12. <p>2). Medicine</p> <ul style="list-style-type: none"> ➤ Some of the antibiotics produced by fungi include Penicillin (<i>Penicillium notatum</i>) ➤ Cephalosporins (<i>Acremonium chrysogenum</i>) ➤ Griseofulvin (<i>Penicillium griseofulvum</i>). ➤ Ergot alkaloids (Ergotamine) produced by <i>Claviceps purpurea</i> is used as vasoconstrictors. <p>3). Production of Organic acid</p> <ul style="list-style-type: none"> ➤ Some of the organic acids and fungi which help in the production of organic acids are ➤ Citric acid and gluconic acid – <i>Aspergillus niger</i>, ➤ Itaconic acid – <i>Aspergillus terreus</i>, ➤ Kojic acid – <i>Aspergillus oryzae</i>. <p>4). Bakery and Brewery</p> <ul style="list-style-type: none"> ➤ Yeast (<i>Saccharomyces cerevisiae</i>) is used for fermentation of sugars to yield alcohol. ➤ Bakeries utilize yeast for the production of Bakery products like Bread, buns, rolls etc., ➤ <i>Penicillium roquefortii</i> and <i>Penicillium camemberti</i> were employed in cheese production. 	5 X 1	5

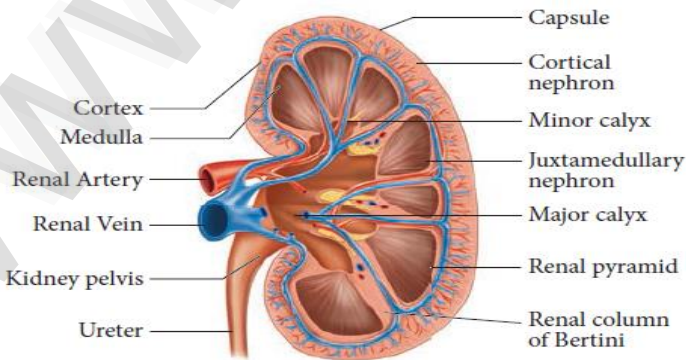
	<p>5). Production of enzymes</p> <ul style="list-style-type: none"> ➤ <i>Aspergillus oryzae</i>, <i>Aspergillus niger</i> were employed in the production of enzymes like amylase, protease, lactase etc. ➤ Rennet which helps in the coagulation of milk in cheese manufacturing is derived from <i>Mucor</i> sp. <p>6). Agriculture</p> <ul style="list-style-type: none"> ➤ Fungi like <i>Rhizoctonia</i>, <i>Phallus</i>, <i>Scleroderma</i> helps in absorption of water and minerals. ➤ Fungi like <i>Beauveria bassiana</i>, <i>Metarhizium anisopliae</i> are used as Biopesticides to eradicate the pests of crops. <p>2. Harmful activities</p> <ul style="list-style-type: none"> ➤ <i>Aspergillus</i>, <i>Rhizopus</i>, <i>Mucor</i> and <i>Penicilium</i> are involved in spoilage of food materials. ➤ Fungi like <i>Amanita phalloides</i>, <i>Amanita verna</i>, <i>Boletus satanus</i> are highly poisonous due to the production of Toxins (Toad stools) ➤ <i>Aspergillus flavus</i> infest dried foods and produce carcinogenic toxin (aflatoxin) 		
<p>22. (a). BB</p>	<p>Economic importance of the family Fabaceae: (any five)</p> <ul style="list-style-type: none"> ➤ i). Pulses – The seeds of <i>Cajanus cajan</i> are sources of protein and starch of our food. ➤ ii). Food plants --Tender fruits of <i>Lablab purpureus</i> are used as Vegetables. ➤ iii). Oil Plants -- Oil extracted from the seeds of <i>Arachis hypogaeis</i> is edible and used for cooking. ➤ iv). Timber Plants – Timber of <i>Dalbergia latifolia</i> is used for making furniture, cabinet articles and as building materials. ➤ v). Medicinal Plants – Roots of <i>Crotalaria albida</i> is used as purgative -- Seeds of <i>Psoralea corylifolia</i> is used in leprosy and leukoderma. ➤ vi). Fibre Plants – Stem fibres of <i>Crotalaria juncea</i> is used for making ropes. ➤ Vii). Pith Plant – Stem pith of <i>Aeschynomene aspera</i> is used for packing, handicraft and fishing floats. ➤ Viii). Dye Plants – Leaves of <i>Indigofera tinctoria</i> -Indigo dye obtained from leaves is used to colour printing and in paints. -- Flowers and seeds of <i>Clitoria ternatea</i> - Blue dye is Obtained. <p style="text-align: center;">(Or)</p>	<p>5 X 1</p>	<p>5</p>
<p>(b). B.IN</p>	<p>Polytene chromosomes: -</p> <ul style="list-style-type: none"> ➤ Observed in the salivary glands of <i>Drosophila</i> (fruit fly) by E.G. Balbiani in 1881. ➤ A single chromosome which is present in multiple copies form a structure called polytene chromosome which can be seen in light microscope. ➤ They are genetically active. ➤ There is a distinct alternating dark bands and light inter-bands. ➤ About 95% of DNA are present in bands and 5% in inter-bands. 		

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II. BIO- ZOOLOGY – KEY ANSWER

Max. Marks: 35

SECTION - 1			
Note: - (i). Answer all the questions.			8 X 1 = 8
Q. No	Options	Answer	
1. BB	A	Physalia – Portugese man of war	
2. B.IN	C	1 – iii, 2 – iv, 3 – i, 4 – ii	
3. B.IN	C	Both the statements 1 and 2 are correct	
4. BB	A	Greater than the hydrostatic pressure	
5. B.IN	A	In the liver but eliminated mostly through kidneys	
6. BB	D	Amoeboid	
7. B.IN	A	Movement of head	
8. BB	C	ii and iv are not correct	
SECTION – 2			
Answer any 4 questions:			4 X 2 = 8
Q. No	Answer		Marks
9. BB	Role of Charles Darwin in relation to concept of species: - ➤ In his book Origin of species explains the evolutionary connection of species by the process of natural selection.		2 2
10. BB	Functions of air bladder in fishes: - ➤ It helps in gaseous exchange in lung fishes ➤ Maintaining buoyancy in most of the ray finned fishes		1 1 2
11. B.IN	Distinguish Male frog from Female frog: - ➤ The male frog has a pair of vocal sacs and a copulatory or nuptial pad on the ventral side of the first digit of each forelimb. ➤ Vocal sacs and nuptial pads are absent in the female frogs.		1 1 2
12. B.IN	Oxygenhaemoglobin dissociation curve is obtain: - ➤ It is obtained when percentage saturation of haemoglobin with oxygen is plotted against pO ₂ . ➤ This curve is called sigmoid curve (S-shaped)		1 ½ ½ 2
13. B.IN	Structure of human kidney  Draw & label		2 1 + 1

14. BB	Symptoms of acromegaly: - (any four) <ul style="list-style-type: none"> ➤ Over growth of hand bones, feet bones, jaw bones, ➤ Malfunctioning of gonads, ➤ Enlargement of viscera, tongue, lungs, heart, liver, spleen and ➤ Endocrine gland like thyroid, adrenal etc., 	4 X ½	2
SECTION - 3 Answer any three of the following including Q.No.19 which is compulsory			
15. BB	Characters of bony fishes: - (any three) <ul style="list-style-type: none"> ➤ Both marine and freshwater fishes with bony endoskeleton. ➤ Spindle shaped body. ➤ Skin is covered by ganoid, cycloid or ctenoid scales. ➤ Respiration is by filamentous gills and covered by an operculum. ➤ Ventrally placed two chambered hearts. ➤ Excretory organs are mesonephric kidneys and are ammonotelic. ➤ Presence of well-developed lateral line sense organ. ➤ Sexes are separate. ➤ External fertilization is seen and most forms are oviparous 	3 X 1	3
16. BB	Bile juice contains no digestive enzymes: - <ul style="list-style-type: none"> ➤ The bile contains bile pigments, bile salts, cholesterol and phospholipids but has no enzymes. ➤ Helps in emulsification of fats. ➤ Bile salts reduce the surface tension of fat droplets and break them into small globules. ➤ Bile also activates lipases to digest lipids. 	1 1 1	3
17. BB	Functions of skeletal system: - (any three) <ul style="list-style-type: none"> ➤ Support –Forms a rigid framework and supports the weight of the body against gravity. ➤ Shape - Provides and maintains the shape of the body. ➤ Protection – Protects the delicate internal organs of the body. ➤ Acts as reservoir – Stores minerals such as calcium and phosphate. ➤ Locomotion – Acts as lever along with the muscles attached to it. ➤ Strength – Can withstand heavy weight and absorbs mechanical shock. ➤ As a haemopoietic tissue – Red and White blood cells are produced in the bone marrow of the ribs, spongy bones of vertebrae and long bones. 	3 X 1	3
18. BB	Advantages of Artificial insemination: - <ul style="list-style-type: none"> ➤ Increases the rate of conception ➤ Avoids genital diseases ➤ Semen can be collected from injured bulls which have desirable traits. ➤ Superior animals located apart can be bred successfully 	3 X 1	3
19. BB	Role of Pineal gland: - (any three) <ul style="list-style-type: none"> ➤ Secretes the hormone melatonin ➤ Which plays a central role in the regulation of circadian rhythm of our body and maintains the normal sleep wake cycle. ➤ Regulates the timing of sexual maturation of gonads. ➤ Melatonin also influences metabolism, pigmentation, menstrual cycle and defence mechanism of our body. 	3 X 1	3

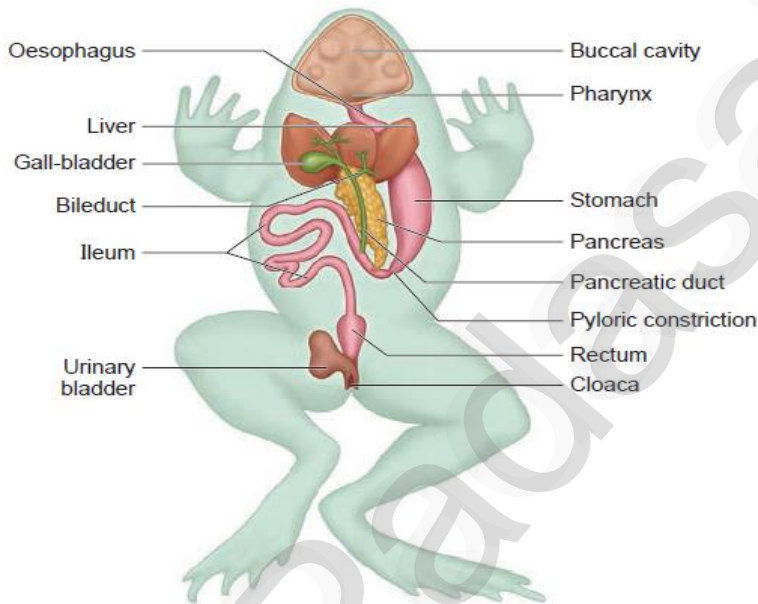
SECTION - 4

Answer the following

2 X 5 = 10

20.
(a).
B.IN**Structure of the Digestive system of Frog: -**

- The alimentary canal consists of the buccal cavity, pharynx, oesophagus, duodenum, ileum and the rectum which leads to the cloaca.
- The wide mouth opens into the buccal cavity.
- The tongue is attached in front and free behind.
- A row of small and pointed maxillary teeth is found on the inner region of the upper jaw.
- The lower jaw is devoid of teeth.
- The buccal cavity that leads to the oesophagus through the pharynx.
- Oesophagus is a short tube that opens into the stomach and continues as the intestine, rectum and finally opens outside by the cloaca.
- Liver secretes bile which is stored in the gall bladder.
- Pancreas, a digestive gland produces pancreatic juice containing digestive enzymes.

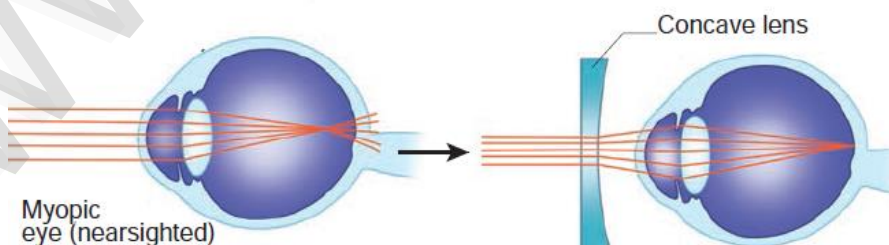


(Or)

(b)

Refractive errors of Eye: -**1. Myopia (near sightedness): -**

- The affected person can see the nearby objects but not the distant objects.
- This condition may result due to an elongated eyeball or thickened lens; so that the image of distant object is formed in front of the yellow spot.
- This error can be corrected using concave lens that diverge the entering light rays and focuses it on the retina.



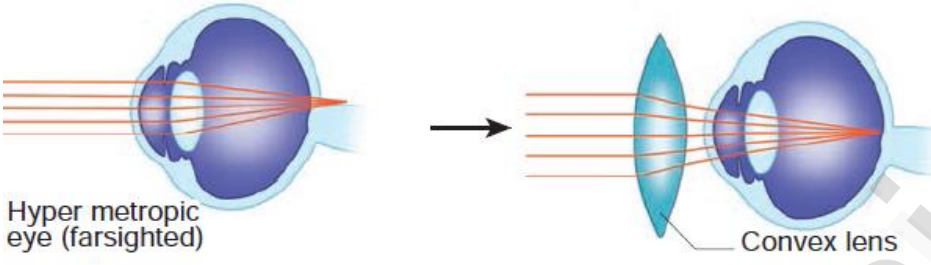
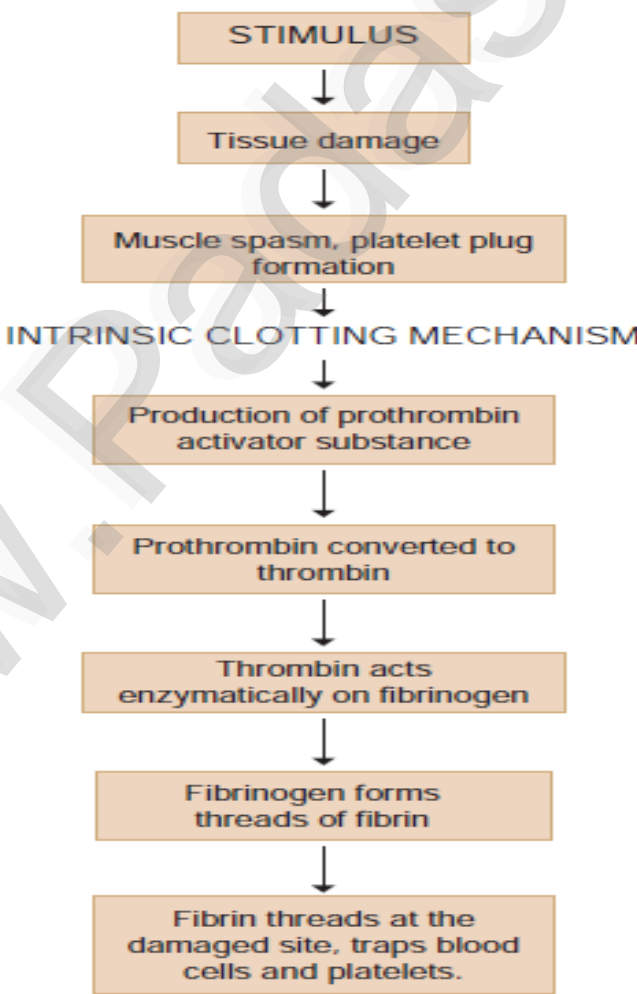
3

1 + 1

5

1

 $\frac{1}{2}$

	<p>2. Hypermetropia (long sightedness):</p> <ul style="list-style-type: none"> ➤ The affected person can see only the distant objects clearly but not the objects nearby. ➤ This condition results due to a shortened eyeball and thin lens; so, the image of closest object is converged behind the retina. ➤ This defect can be overcome by using convex lens that converge the entering light rays on the retina.  <p>3. Presbyopia:</p> <ul style="list-style-type: none"> ➤ Due to aging, the lens loses elasticity and the power of accommodation. ➤ Convex lenses are used to correct this defect. <p>4. Astigmatism:</p> <ul style="list-style-type: none"> ➤ It is due to the rough (irregular) curvature of cornea or lens. ➤ Cylindrical glasses are used to correct this error. 	<p>1</p> <p>5</p> <p>½</p> <p>1</p> <p>1</p>	
<p>22. (a) B.IN</p>	<p>Schematic representation of blood coagulation: -</p>  <p>(Or)</p>	<p>5</p>	<p>5</p>

<p>(b). B.IN</p>	<p>Multiple ovulation embryo transfer technology: -</p> <ul style="list-style-type: none"> ➤ Method of propagation of animals with desirable traits. ➤ This method is applied when the success rate of crossing is low even after artificial insemination. ➤ In this method Follicle stimulating hormone (FSH) is administered to cows for inducing follicular maturation and super ovulation. ➤ Instead of one egg per cycle, 6-8 eggs can be produced by this technology. ➤ The eggs are carefully recovered non-surgically from the genetic mother and fertilized artificially ➤ The embryos at 8-32 celled stages are recovered and transferred to a surrogate mother. ➤ For another round of ovulation, the same genetic mother is utilized. ➤ This technology can be applied to cattle, sheep and buffaloes. ➤ Advantage-- Produce high milk yielding females and high-quality meat yielding bulls in a short time. 	<p>8 X ½</p>	<p>5</p>
		<p>1</p>	

**B. LOGANATHAN,
GHSS, MAMBAKKAM,
CHENGALPATTU DIST.**